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Final Report

Mine Seal Project, Phase 15  
Kendall, Fergus County, Montana  
IFB 4169-G

January, 1987

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**L. C. HANSON COMPANY**

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Final Report

Mine Seal Project, Phase 15  
Kendall, Fergus County, Montana  
IFB 4169-G

January, 1987

Prepared for: Mr. Richard Juntunen, Chief  
Abandoned Mine Reclamation  
Bureau  
Department of State Lands  
1625 11th Ave.  
Helena, MT 59620

Prepared by: L.C. Hanson Company  
Consulting Engineers  
P.O. Box 299  
Helena, MT 59624

Project Inspector: Bruce Brannon



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## I. Introduction

### A. Project Objectives

The Phase 15 Mine Seal Project was undertaken to eliminate the public safety hazards resulting from unreclaimed mine openings at several abandoned mines in Fergus County, Montana. Closure of dangerous shafts and adits through backfilling, bulkhead installation, and/or fencing was accomplished to eliminate accidental entry.

### B. Project Location

The project covered eleven sites located in the North Mocassin Mountains, approximately fifteen miles north of Lewistown, Montana. The sites were located in Sections 29, 31 & 32, T18N R18E near the old town site of Kendall. and are shown on the vicinity map contained herein.

### C. History

Hardrock mining has taken place in Montana since 1862 and was essentially unregulated from a reclamation standpoint for over one hundred years. This resulted in thousands of hazardous shafts and adits in mining districts across the state.

A brief history of the Kendall Mining District follows:

Gold was discovered in 1893 but the region remained undeveloped until 1900 when a cyanide plant was built to treat the ores. The district was important until the dissolution of the Barnes King Mining Co., in 1920. Total production is estimated at \$9,000,000.

### D. Site Description And Problems

The sites included in this project are located in or near residential areas, historic sites, close to public roads or in recreation areas. All mine openings threatened public safety. The shafts involved were of a depth great enough to prevent unaided escape upon entry. Adits were reclaimed or bulkheaded to protect the curious from unsuspected dangers.





## II. Description of Project Reclamation

### A. Project Planning

Backfill was recommended for all mine openings to permanently eliminate the hazards. Many landowners refused to allow this, insisting instead on accessing bulkheads or fencing. These techniques do accomplish the goal of preventing accidental entry but are semi-permanent in nature and may require maintenance in the future.

### B. Chronological History

Pre-Bid Conference	June 15, 1984
Bid Opening	June 28, 1984
Contract Award	July 5, 1984
Contract Awarded To:	

Montgomery Construction  
P.O. Box 755  
Hilger, MT 59451  
(406)538-9811

Pre-Construction Meeting	August 1, 1984
Notice to Proceed	August 13, 1984
Began Work	August 31, 1984
Project Completed	October 15, 1984

### C. Equipment

Terex 2 1/4 yd. loader  
Cat DW 21 scrapers (2)  
Cat D8 Dozers (2)

### D. Construction Operations

The Contractor performed the following:

1. Backfilled 1 trench
2. Backfilled 1 incline
3. Backfilled 2 adits
4. Backfilled 4 shafts
5. Installed steel door (9'x 7')
6. Installed combination barbed and woven wire fence at 1 site
7. Installed chainlink fence at 1 site
8. Revegetated all areas disturbed by construction activities





### III. Cost Summary

#### A. Final Payment Request

A copy of the Final Payment Request is contained in Appendix A. That document contains the final quantities and costs for work at each site.

#### B. Change Order

The following Change Order was executed during the course of the project:

1. Change Order #1 - Backfill adit in lieu of installing steel door, required borrow to backfill a shaft, and backfill adit in lieu of blasting.

#### C. Cost Per Site / Unit

The unit costs and total costs for the various sites are shown in the Final Pay Request contained in Appendix A.

### IV. Summary

#### A. Completed Reclamation

The required work was completed within the Contract time allowed.

The project resulted in the complete plugging of some adits and shafts and limits access to other shafts and adits by installed doors and fences. Hazard signs were installed where appropriate. Revegetation of disturbed areas was also accomplished.

#### B. Comments

The Contractor completed the work as specified.

Monitoring of all sites should be undertaken periodically to insure all backfilling and fencing work and revegetation efforts remain intact.

The Contract Documents were prepared by others. L. C. Hanson Company provided the project Inspector and handled the administration of the Contract.

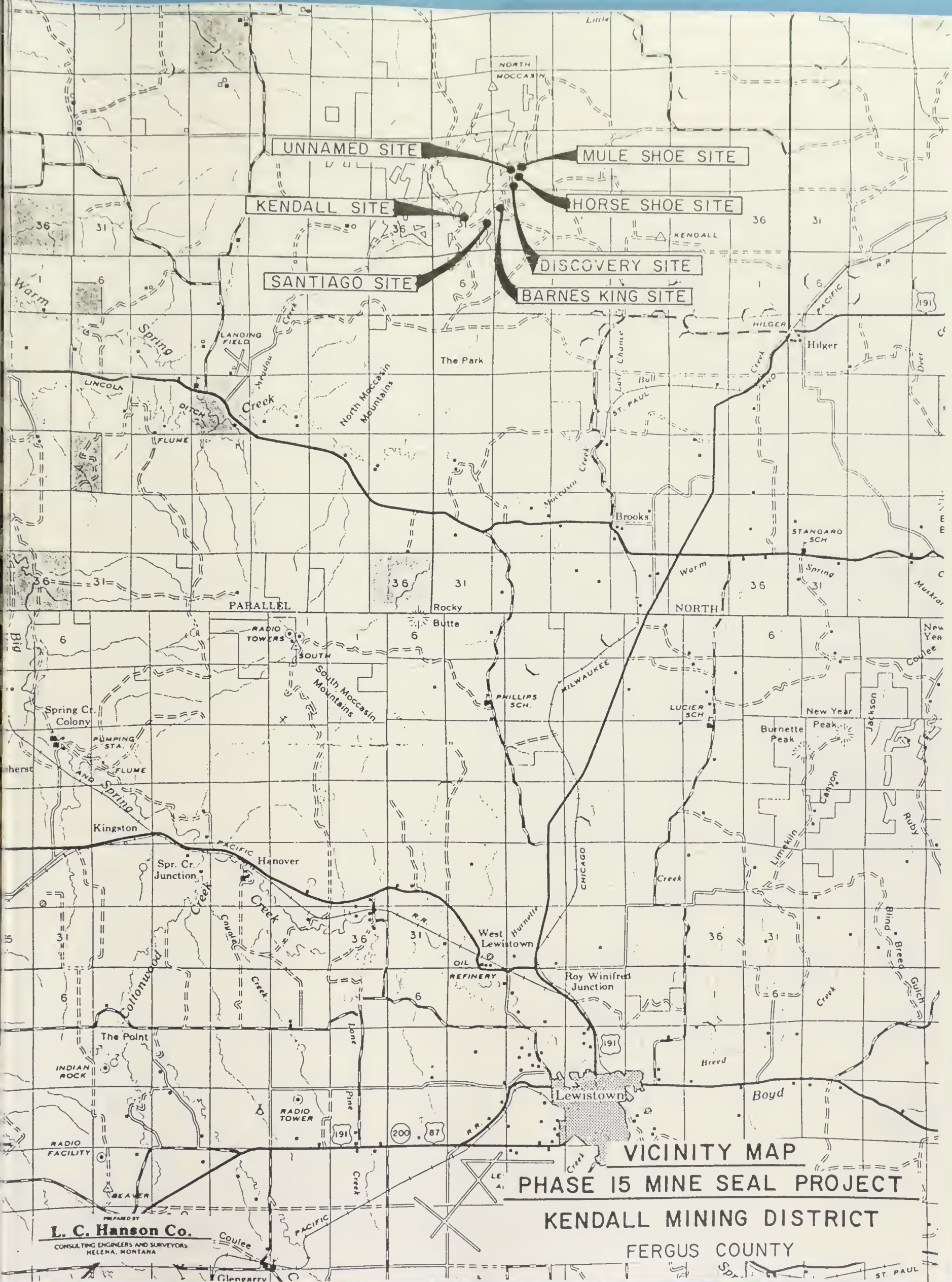


V. Slides

The slide log and slides are contained in Appendix B.







UNNAMED SITE

MULE SHOE SITE

KENDALL SITE

HORSE SHOE SITE

SANTIAGO SITE

DISCOVERY SITE

BARNES KING SITE

VICINITY MAP

PHASE 15 MINE SEAL PROJECT

KENDALL MINING DISTRICT

FERGUS COUNTY

PREPARED BY  
**L. C. Hanson Co.**

CONSULTING ENGINEERS AND SURVEYORS  
HELENA, MONTANA



## APPENDIX A





FROM August 13, 1984 TO October 15, 1984

 PROJECT NAME KENDALL SITES - MINE SEAL PHASE 15 - FERGUS COUNTY, MONTANA

 LOCATION FERGUS COUNTY, MONTANA

 PROJ. NO. IFB 4169-G

 NAME OF CONTRACTOR Montgomery Construction ADDRESS Box 755 Hilger, MT 59451

CHANGE ORDERS			CONTRACT STATUS			
No.	Description	Amount	Total Amount	Completed Amount	Uncompleted Amount	Per Cent Complete
1	See attached Change Order	187.20	24,360.00	25,355.19	-0-	100
Total Change Orders			187.20	205.20		
CONTRACT TO DATE INCLUDING CHANGE ORDERS			24,547.20	25,560.39	-0-	100

TOTAL RETAINAGE \$	COMPLETED TO DATE \$	25,560.39
SECURITIES ON DEPOSIT \$	PLUS MATERIALS ON SITE \$	-0-
ADJUSTED RETAINAGE \$	TOTAL COMPLETED TO DATE \$	25,560.39
*For use only when securities are on deposit in lieu of 10% retainage.	*10% OR ADJUSTED RETAINAGE \$	-0-
	TOTAL AMOUNT EARNED TO DATE \$	25,560.39
	LESS PREVIOUS PAYMENTS \$	-0-
	AMOUNT DUE THIS PAYMENT \$	25,560.39
	LESS 1% TAX \$	255.60
	TOTAL DUE CONTRACT \$	25,304.79

I certify that this claim is correct and just in all respects and that payment or credit has not been received.

Montgomery Construction

(Contractor)

By [Signature]

Date 11/7/84

RECOMMENDED BY:

L. C. Hanson Company

(Engineer)

By [Signature]

Date 11/7/84

Approved By:

Montana Department of State Lands

Owner

[Signature]

11/8/84



MINE SEAL PROJECT, PHASE 15  
KENDALL SITES, FERGUS COUNTY, MONTANA

IFB 4169-G ITEMIZATION OF QUANTITIES AND COSTS						
ITEM	DESCRIPTION	ESTIMATED PLAN QUANTITY	UNIT PRICE BID	UNITS OF WORK COMPLETED TO DATE	TOTAL COST OF COMPLETED WORK	PERCENT COMPLETE
4.19	MOBILIZATION	LUMP SUM	0.00	-0-	-0-	-0-
4.20	HAZARD SIGN INSTALLATION	12 EACH	50.00 EA	12 EACH	600.00	100
4.23	SEEDING, FERTILIZING & SEEDBED PREPARATION OF TRENCH #1, HORSE SHOE SHAFTS, HORSE SHOE INCLINE, SANTIAGO SHAFT, DISCOVERY SHAFT	LUMP SUM	2,500.00	LUMP SUM	2,500.00	100
4.26	BACKFILL AND GRADE TRENCH #1	LUMP SUM	2,000.00	LUMP SUM	2,000.00	100
4.27	BLAST UNNAMED ADIT CLOSED	LUMP SUM	1,000.00	LUMP SUM	1,000.00	100
* 4.28	STEEL DOOR ON HORSE SHOE ADIT	1 EACH	850.00 EA *(500.00 EA)	1 EACH	500.00	100
4.29	STEEL DOOR ON MULE SHOE ADIT	1 EACH	850.00 EA	1 EACH	850.00	100
* 4.30	BACKFILL AND GRADE HORSE SHOE SHAFT	1000 LCY	1.00/LCY *(3.33)	400 LCY	1,332.00	100
	REMOVE EXISTING FENCE AROUND SHAFT	LUMP SUM	100.00	LUMP SUM	100.00	100
4.31	BACKFILL & GRADE HORSE SHOE INCLINE	LUMP SUM	900.00	LUMP SUM	900.00	100
4.32	BACKFILL THE BARNES KING SHAFT	1600 LCY	1.25 LCY	1222 LCY	1,527.50	100
	REMOVE EXISTING FENCE AROUND SHAFT	LUMP SUM	100.00	LUMP SUM	100.00	100
4.33	BACKFILL & GRADE SANTIAGO SHAFT	750 LCY	3.33 LCY	893 LCY	2,973.69	119
4.34	BACKFILL & GRADE DISCOVERY SHAFT	LUMP SUM	2,000.00	LUMP SUM	2,000.00	100
4.35	WIRE FENCE AROUND KENDALL PIT	3150 L.F.	1.50 L.F.	2868 L.F.	4,302.00	100
	SINGLE PANELS	11 EACH	50.00 EA	2 EACH	100.00	100
	DOUBLE PANELS	5 EACH	75.00 EA	15 EACH	1,125.00	300
	CORNERS	9 EACH	90.00 EA	7.5 EACH	675.00	100
	GATES (2) @ 10 L.F. EA	20 L.F.	10.00 L.F.	32 L.F.	320.00	160

\* See Change Order No. 1





MINE SEAL PROJECT, PHASE 15  
KENDALL SITES, FERGUS COUNTY, MONTANA

IFB 4169-G		ITEMIZATION OF QUANTITIES AND COSTS				
ITEM	DESCRIPTION	ESTIMATED PLAN QUANTITY	UNIT PRICE BID	UNITS OF WORK COMPLETED TO DATE	TOTAL COST OF COMPLETED WORK	PERCENT COMPLETE
4.36	CHAIN LINK FENCE AROUND KENDALL SHAFT	40 L.F.	10.00 L.F.	170 L.F.	1,700.00	100
	GATE (1)	10 L.F.	30.00 L.F.	10 L.F.	300.00	100
	DOUBLE PANELS(120 L.F.)	6 EACH	100.00 EA	4.5 EA	450.00	100
					25,355.19	
		Add Item 3 of Change Order #1			205.20	
		TOTAL CONTRACT COST INCLUDING CHANGE ORDER NO. 1			<u>\$25,560.39</u>	





SECTION II

2.10 CHANGE ORDER

Order No. One (1)

Date: November 2, 1984

Agreement Date: July 30, 1984

NAME OF PROJECT: MINE SEAL PROJECT, PHASE 15 - KENDALL SITES, FERGUS COUNTY, MT

IFB 4169-G

OWNER: MONTANA DEPARTMENT OF STATE LANDS

CONTRACTOR: MONTGOMERY CONSTRUCTION, Box 755, Hilger, Montana 59451

The following changes are hereby made to the CONTRACT DOCUMENTS:

Justification: See Attached Sheet.

Change to CONTRACT PRICE:

Original CONTRACT PRICE \$ 24,360.00

Current CONTRACT PRICE adjusted by previous CHANGE ORDER \$ No previous Change Order

The CONTRACT PRICE due to this CHANGE ORDER will be increased by: \$ 187.20

The new CONTRACT PRICE including this CHANGE ORDER will be: \$ 24,547.20

Change to CONTRACT TIME:

The CONTRACT TIME will be (increased) (decreased) by 0 calendar days.

The date for completion of all work will be October 15, 1984 (Date).

Recommended by: L. C. Hanson Co. James D. Schim, Engineer

Accepted by: Montgomery Construction John Montgomery, Contractor

Approved by: Department of State Lands Richard J. Hunt, Owner  
Abandoned Mine Reclamation Bureau



Change Order No. 1

PROJECT: MINE SEAL PROJECT, PHASE 15 - KENDALL SITES - FERGUS COUNTY, MONTANA  
IFB 4169-G

OWNER: Montana Department of State Lands

CONTRACTOR: Montgomery Construction

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November 2, 1984

- Justification:
1. Because Landowner permission to backfill was granted, the "Steel Door on Horse Shoe Adit" (Bid Item 4.28) was deleted and the adit was backfilled instead at an agreed price of \$500.00, a decrease of \$350.00 in the Contract price.
  2. Material to "Backfill and Grade Horse Shoe Shaft" (Bid Item 4.30) must be hauled from a borrow area rather than from material adjacent to shaft as stated in the Contract. Therefore, an adjustment of \$3.33 from \$1.00 LCY (as stated in July 31, 1984 Agreement Letter) was negotiated based on comparable work at the SANTIAGO SHAFT for a bid price of \$3.33, an increase of \$332.00 in the Contract price.
  3. The work at the UNNAMED ADIT (Bid Item 4.27) was changed from blasting shut to backfilling the adit. This in turn required Seeding, Fertilizing and Mulching of approximately 1800 square feet at an agreed price of \$205.20, an increase of \$205.20 in the Contract price.

The above changes result in a net increase in the Contract price of \$187.20.



## APPENDIX B





Phase 15 Mine Seal Project  
Kendall Mining District, Fergus County  
Slide Log

1. Sept., 1983	Before:	Barnes-King shaft - backfill site
2. Sept., 1983	Before:	Barnes-King shaft - backfill site
3. Aug., 1984	Before:	Barnes-King shaft - backfill site
4. Aug., 1984	Before:	Barnes-King shaft - backfill site
5. Aug., 1984	Before:	Barnes-King shaft - backfill site
6. Aug., 1984	During:	Barnes-King shaft - backfilling
7. Aug., 1984	During:	Barnew-King borrow area - hauling
8. Aug., 1984	During:	Barnew-King borrow area - hauling
9. Aug., 1984	During:	Barnew-King borrow area - hauling
10. Oct., 1984	After:	Discovery shaft - mulched
11. Sept., 1983	Before:	Horseshoe shaft - backfill site
12. Sept., 1983	Before:	Horseshoe shaft - backfill site
13. Sept., 1983	Before:	Horseshoe shaft - backfill site
14. Sept., 1984	During:	Horseshoe shaft - backfilling
15. Sept., 1984	During:	Horseshoe shaft - backfilling
16. Sept., 1984	During:	Horseshoe shaft - backfilling
17. Sept., 1984	After:	Horseshoe shaft - completed backfill
18. Sept., 1984	After:	Horseshoe shaft - mulched
19. Sept., 1984	During:	Horseshoe borrow area - scraper
20. Sept., 1984	During:	Horseshoe borrow area - loading
21. Aug., 1984	Before:	Horseshoe portal - backfill site
22. Oct., 1984	During:	Horseshoe portal - road widened to haul
23. Oct., 1984	After:	Horseshoe portal - mulched
24. Sept., 1984	Before:	Horseshoe incline - backfill site
25. Sept., 1983	Before:	Horseshoe incline - backfill site
26. Sept., 1984	After:	Horseshoe incline - completed backfill
27. Sept., 1984	After:	Horseshoe incline - completed backfill
28. Sept., 1984	After:	Horseshoe incline - mulched
29. Sept., 1983	Before:	Kendall - general view
30. Sept., 1983	Before:	Kendall shaft - fencing site
31. Oct., 1984	After:	Kendall shaft - completed fence
32. Oct., 1984	After:	Kendall shaft - completed fence
33. Oct., 1984	After:	Kendall shaft - completed fence
34. Sept., 1983	Before:	Kendall pit - fencing site
35. Sept., 1983	Before:	Kendall pit - fencing site
36. Sept., 1983	Before:	Kendall pit - fencing site
37. June, 1983	Before:	Kendall pit - fencing site
38. June, 1983	Before:	Kendall pit - fencing site
39. June, 1983	Before:	Kendall pit - fencing site
40. June, 1983	Before:	Kendall pit - fencing site
41. Oct., 1984	After:	Kendall pit - completed fence
42. June, 1983	Before:	Mule Shoe portal - adit door site
43. June, 1983	Before:	Mule Shoe portal - adit door site
44. Aug., 1984	During:	Mule Shoe portal - dozing access road
45. Aug., 1984	During:	Mule Shoe portal - door installation
46. Aug., 1984	During:	Mule Shoe portal - door installation
47. Aug., 1984	After:	Mule Shoe portal - door installed





48. Sept., 1983	Before:	Santiago shaft - backfill site
49. Sept., 1983	Before:	Santiago shaft - backfill site
50. Sept., 1984	Before:	Santiago shaft - backfill site
51. Sept., 1984	Before:	Santiago shaft - backfill site
52. Sept., 1984	During:	Santiago shaft - backfilling
53. Sept., 1984	During:	Santiago shaft - backfilling
54. Sept., 1984	During:	Santiago shaft - backfilling
55. Sept., 1984	During:	Santiago shaft - backfilling
56. Sept., 1984	During:	Santiago shaft - backfilling
57. Sept., 1984	After:	Santiago shaft - completed backfill
58. Aug., 1984	Before:	Trench - backfill site
59. Aug., 1984	Before:	Trench - backfill site
60. Aug., 1984	Before:	Trench - backfill site
61. Oct., 1984	After:	Trench - backfilled
62. Sept., 1983	Before:	Unnamed adit - backfill site
63. Aug., 1984	Before:	Unnamed adit - backfill site





